Space Weather Forecast

Issued on Monday 11 November 2024 at 00:42 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity is likely, with a slight chance of Strong class flares. Chance of G1/Minor Geomagnetic storms 13 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the period, with three Moderate class flares from a large region in the southeast, the largest peaking at 10/1206 UTC. There are seven sunspot regions on the visible disc. The large region southeast is the largest and most complex region. It contains a number of mature spots and now has two delta regions, one in the trailing and another, perhaps more significant region, in the leading portion, where continued growth has occurred. Another region in the southwest, has mature leading and trailing spots, but has seen some decay in the spots occupying the intermediate region. The remaining spot regions are smaller and magnetically simple.

No Earth-directed CMEs (Coronal Mass Ejections) were observed.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of ongoing magnetic cloud and coronal hole high speed stream influences. Wind speeds varied between slightly elevated and background. The Interplanetary Magnetic Field was generally Moderate. The north-south component was mostly southward (negative) directed at Weak to Moderate levels, but rotated to weakly positive towards the end of the period. A noticeable kick in the UK Magnetometers was observed around 10/1830 UTC, with Hartland showing a deflection of 118nT. This is believed to be in association with a HSS from the coronal hole in the southwest, but there was no evidence of increased geomagnetic activity at near earth satellites prior to this event.

Resultant Geomagnetic Activity was generally quiet to Active (Kp 2-4), with a G1 Minor Storm (Kp 5) interval at 10/0300-0600UTC and a G2 Moderate storm (Kp6) interval at 10/1800-2100.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is forecast, with a likelihood of isolated Moderate class flares and a slight chance of Strong class flares, most probably from the complex sunspot in the east of the disk.

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Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently forecast. Fast wind influences are expected through this period, initially from a coronal hole in the southwest of the disc and later from the large coronal hole to the north, currently crossing centre disc. Current slightly elevated winds are expected to decline to background through Day 1 (11 Nov), before becoming elevated again towards the end of the period.

Generally Quiet to Unsettled (Kp2-3) activity is forecast but with Active (Kp4) intervals likely and a chance of peak G1/Minor Storm conditions, most likely Days 1 and 4 (11 and 14 Nov) due to the risk of HSS influence. Unsettled to Active (Kp3-4) condition increasingly likely to end the period, with a chance of G1/Minor Storm conditions upon the connection to CH90/+.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background levels. There is a rising slight chance of S1/Minor Proton Storms should we see any significant flares.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	Yes	30	10	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	70	70	70	70
Very Active	R3-R5 (X Class)	No	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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